

Maternal and fetal complications from COVID-19; a comparative analysis

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ABSTRACT:

Background: The pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has exposed vulnerable populations of pregnant ladies to an unprecedented global health crisis. The data from previous human coronavirus pandemics suggest that pregnant women and their fetuses are particularly susceptible, leading to poor outcomes. The objective of this study was to summarize the clinical manifestations and maternal and perinatal outcomes during pregnancy in pandemic COVID-19 and compare them with non-pandemic in 2019.

Material and Methods: A total of 2169 pregnant women in the third trimester of their pregnancies who delivered in our hospital from May 2020 to August 2020 were selected as observation group (during pandemic COVID-19), while 1812 pregnant ladies who gave birth from May 2019 to Aug 2019 as a control group (during non-pandemic). A comparative analysis of the two groups was performed with the chi-square test, and P-value was calculated for significance between the two groups.

Results: The difference in the overall rate of maternal complications and fetal outcome was not statistically significant. The maternal complications post-term pregnancy and preterm delivery ($P < 0.05$) are significantly more in the observed group than in the control group. Furthermore, we found that among fetal outcome birth asphyxia was significantly more in the observed group than the control group.

Conclusion: : In the COVID-19 pandemic and the antenatal care provision, this comparative analysis of maternal and fetal complications shows an excellent management plan despite robust applications of pandemic SOPS, as there is no significant difference in both groups.

Keywords: COVID-19, antenatal care, coronavirus, pandemic, maternal morbidity; maternal mortality, neonatal morbidity, neonatal mortality, pregnancy.

Introduction

The pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has exposed vulnerable populations of pregnant ladies to an unseen global health crisis. The data from previous human coronavirus pandemics suggest that pregnant women and their fetuses are particularly susceptible, leading to poor outcomes.

The current outbreak of COVID-19, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was declared a pandemic by the World Health Organization (WHO) on 11th March 2020 and is reached to peak around April 2020, and day by day, the spread is going on.¹

Pregnancy is an extraordinary time. It is full of excitement, but for expectant mothers facing the coronavirus disease (COVID-19) outbreak, fear, anxiety, and uncertainty are clouding this otherwise happy time. Many expectant mothers are fearful of going to the hospital while practicing SOPs, such as staying home and practicing physical distancing when outside.²

Lots of adaptation is happening in the world where midwives are doing clinics or certain appointments by phone. Modifications may also be tailored for individual patients depending on their respective conditions, for example, lower vs. higher-risk pregnancies.³

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Care of antenatal ladies and health care services have been affected by the COVID-19 pandemic. We know the reality that pregnant women were placed in the vulnerable group because the pregnant women need prevention and control of COVID-19 infection. Still, the potential risk of vertical transmission is also significant.⁴

However, the COVID-19 pandemic has led to maternity services adjusting how they provide antenatal care to pregnant women due to the government restrictions in the COVID-19 outbreak. Social distancing, which has impacted pregnant women's access to routine antenatal care and the fear and anxiety in patients, caused a significant effect on the antenatal services. The advice to all pregnant women from the Royal College of Obstetricians and Gynecologists is to decide if the need for an antenatal appointment is greater than the risk of being exposed to COVID-19.^{5,6}

Women's rights to have optimum antenatal care are threatened; if they have an appointment that does not involve an ultrasound or laboratory test, they are told not to come to the hospital or visit a health center.^{7,8}

women and health care personal remain very much affected; care during pregnancy, birth, and the postnatal weeks has changed radically and fast. Essential elements of the obstetrician-woman relationship, such as meeting in person and providing a comforting touch, have been upended in an attempt to maintain distance and reduce cross-infection. Women were encouraged to keep attending hospitals even as these are being recognized as 'COVID-19' hot spots, for those with complex medical and obstetric conditions should have access to 'face-to-face' care. At the moment, we have no idea of the impact these necessary adjustments will have on women and babies' wellbeing or women's experiences of birth.⁹

This article summarizes all obstetric patients admitted to gynae and obstetric units in the COVID-19 pandemic. We compare the patients admitted with different presentation and management strategies before the pandemic and managing pregnancy in this pandemic.

Maternal and fetal outcomes in terms of maternal and fetal complications- from 1st June to 31st August 2020 and compare it with 2019 data.

Now there is a second wave of this pandemic which may show worse results, and this needs a large number of patients for more accurate results of morbidity and mortality.¹⁰

Material and methods:

A total of 1812 pregnant patients were admitted in the third trimester of pregnancy who gave birth in our hospital from May 2020 to August 2020 were selected as an observed group, while 2169 pregnant women who gave birth in hospital from May 2019 to Aug 2019 were chosen as the control group. The Control group was matched using propensity score matching (PSM)

A comparative analysis of the two groups was performed with the chi-square test, and P-value was calculated.

Results:

The difference in the overall rate of maternal complications and fetal outcome was not statistically significant. The maternal complications, post-term pregnancy, and preterm delivery ($P < 0.05$) are significantly more in the observed group than the control group.

Furthermore, we found that among fetal outcome birth asphyxia was significantly more in the observed group than the control group. (see Table 1,2).

COMPARISON OF COMPLICATIONS IN PREGNANCY

	Variables	Group A 2019	%age	Proportion	Group B 2020	Proportion	%age	P value	Significan ce *: p < 0.05 ** : p < .01 ***: p < .001
	Total Admissions	2169			1812				
1	Pregnancy Induced hypertension	30	1.38%	0.01772	72	0.0595041	3.97%	0.002	**
2	Preeclampsia	16	0.73%	0.009451	10	0.0082645	0.55%	0.071	
3	Eclampsia	8	0.36%	0.004725	8		0.44%	0.635	
4	Chronic hypertension	22	1.01%	0.012995	13	0.0107438	0.71%	0.024	*
5	Post Term Pregnancy	138	6.36%	0.081512	232	0.1917355	12.80 %	0.001	***
6	Preterm delivery	76	3.50%	0.04148472	120	0.083438685	6.62%	0.014	**
7	Gestational Diabetes	14	0.64%	0.008269	12	0.0099174	0.66%	0.314	
8	Placenta Previa	18	0.82%	0.010632	10	0.0082645	0.55%	0.030	*
9	Abruption	14	0.64%	0.008269	19	0.0157025	1.04%	0.839	
10	Premature rupture of membrane	59	2.72%	0.034849	146	0.1206612	8.05%	<.001	***
11	Preterm Premature rupture of membrane	72	3.31%	0.042528	15	0.0123967	0.82%	<.001	***
12	Anemia	20	0.92%	0.011813	10	0.0082645	0.55%	0.012	*
13	Chorioamnionitis	5	0.23%	0.002953	4	0.0033058	0.22%	0.489	
14	Maternal Mortality	1	0.046 %	0.000591	3	0.0024793	0.16%	0.440	
15	Post Partum Hemorrhage	40	1.84%	0.023627	25	0.0206612	1.37%	0.004	**

COMPARISON OF FETAL OUTCOME

Variables	Group A 2019	proportion	% age	Group B 2020	proportion	% age	p value	Significance: *: p < 0.05 **: p < .01 ***: p < .001
Normal fetus	1507		82.2%	1252		79.14%		
Low Apgor score	95	0.29230769	5.18%	112	0.339393939	7.07%	0.195	
Neonatal death	12	0.03692308	0.65%	2	0.006060606	0.12%	0	
Birth asphyxia	48	0.14769231	2.62%	41	0.124242424	2.59%	0.006	**
Meconium stained liquor	100	0.30769231	5.45%	115	0.348484848	7.26%	0.266	
Intra uterine death	64	0.19692308	3.49%	55	0.166666667	3.47%	0.313	
Intra uterine growth restriction	6	0.01846154	0.32%	5	0.015151515	0.31%	0.742	
Total deliveries	1832			1582				

Discussion

Pregnant women and their fetuses represent a high-risk population during infectious disease pandemic outbreaks.

Physiological and mechanical changes in pregnancy are causing immunological changes in pregnancy. It causes increased susceptibility to infections in general; on the other hand, the cardiorespiratory system is highly affected, causing rapid progression to respiratory failure in the gravida.¹¹

Predictions based on similar infections such as SARS and MERS suggest that pregnant women are at an increased risk of severe infection.¹²

The best treatment is prevention in the current situation because there is no treatment and no vaccine available. It is clear from sources of the COVID-19 pandemic that social distancing and hand washing are effective means to stop the spread of the pandemic.¹³

The effect of COVID-19 infection on pregnancy is not entirely known because of the lack of reliable data. If there is an increased risk to pregnant women and fetuses, it has not been readily detectable. Still, the indirect effect matters a lot by affecting the care of the mother and fetus in this pandemic.¹⁴

Women who cannot utilize antenatal services are twice as likely to risk maternal morbidity and mortality. There are drastic changes and

closure of routine maternity services and diversion of resources away from essential pregnancy care; because of prioritizing the COVID-19 response, we are expecting increased risks of maternal morbidity and mortality as routine antenatal clinics were closed altogether, with only emergency services were available, and counseling about practicing of covid 19 pandemic SOPS, itself decrease the number of the influx of antenatal patients in hospital.^{15,16}

The long-term effects of maternal morbidity and mortality on families, societies, and communities are dangerous and should not be overlooked. Attention should be given to providing appropriate antenatal care for high-risk women in the current pandemic. This can be achieved by proficient triad and screening by maternity units to ensure women that need and should have face-to-face consultations are provided this service. This is particularly relevant for hard-to-reach women who, under usual circumstances, may not access or engage with maternity services.^{17,18}

Here we present a review of the effect of pandemic COVID-19 in pregnancy indirectly.

The patients in pregnancy in pandemic compared with the previous year, maternal and fetal complications were noted.

Antenatal patients were presented to the emergency department. A total of 1812 patients were admitted in the pandemic, and

2169 patients were revealed in the non-pandemic year 2019 (control group).

We collected data about complications in pregnancy like preeclampsia, eclampsia, pregnancy-induced hypertension, and chronic hypertension. Diabetes in pregnancy, PROM, PPROM, Maternal Mortality, Antepartum Hemorrhage, postpartum hemorrhage, anemia in pregnancy, chorioamnionitis were compared in both groups; preterm labor and post-term pregnancy were also compared in both groups. (Table 1).

Fetal complications were collected in the form of a low Apgar score, birth asphyxia, neonatal death, intrauterine death, and meconium-stained liquor. Both groups were compared there was no significant difference in both groups.

Except Birth asphyxia was significantly more in observed groups as compared to the control group.

We aim to share a comparison of obstetric patients in pandemic and non-pandemic months. We compared both groups; there was no significant difference.

The P values for two Samples tests of proportion (two-tailed tests) is < 0.005 . (see tables 1,2).

The purpose of this is to share our experiences of COVID-19 on maternity care in Pakistan.

We worked on keeping frontline obstetric care providers safe while continuing to provide essential services. Our clinical service model is built around the principles of workplace segregation, responsible social distancing, containment of cross-infection to healthcare providers, judicious use of personal protective equipment, and telemedicine.¹⁹

The admission of hypertensive patients in the form of preeclampsia, eclampsia, pregnancy-induced hypertension and chronic hypertension, and other antenatal complications like gestational diabetes, post-term pregnancy, and preterm labor could be missed. Anxiety about entering acute hospital settings might deter women from seeking additional care during pregnancy. Most women were reluctant for admission in post-term pregnancy and preterm labor.^{20,21}

COVID-19 represents the largest pandemic of the century. With social distancing as the best protective mechanism, prenatal care spacing and increased telehealth prenatal visits, are

recommended to keep patients and providers safe. Though this pandemic is changing the way we provide prenatal care, following practices of social distancing and proper PPE use, should allow provision of safe care for women and their fetuses.^{22, 23}

In most cases, pregnant women should continue or resume necessary preventive health care visits and should also receive care, as needed, with specialists for non-obstetric conditions. Data indicate that preventive health care visits drastically declined at the beginning of the pandemic, which resulted in a concerning decrease in important routine screenings, tests, and vaccines. Pregnant patients who require care for serious medical conditions are strongly encouraged to maintain or resume necessary appointments.²⁴

Obstetrician other obstetric care practitioners should counsel their pregnant patients that health care facilities are taking precautions to protect patients and staff from SARS-CoV-2 infection. This may include reducing the number of appointments or spacing the visits further apart, mask requirements, screening individuals for SARS-CoV-2 exposure before their appointment, reducing the number of support persons allowed to attend the appointment, and increased cleaning protocols. Obstetrician can encourage pregnant patients to ask about facility precautions at the places where they may seek additional care. Further, telehealth visits remain an option for many types of health care appointments. Pregnant patients should be counseled to continue to follow recommended prevention measures when entering a health care facility. This includes wearing a face mask, maintaining at least six feet distance from others, and practicing hand hygiene frequently.²⁵⁻²⁸

Conclusion:

This comparative analysis of maternal and fetal complications in the COVID-19 pandemic and the antenatal care provision shows excellent management plans despite robust applications of pandemic SOPS, as there is no significant difference in both groups.

The results may provide useful information to management practices regarding pregnancy and childbirth after lockdown, enabling better control of preterm delivery and post-term pregnancy and birth asphyxia.

Recommendations:

We recommend that women pay more attention to controlling the complication in pregnancy. For this purpose, separate special clinics by midwives and LHV for regular patients care and proper and on-time referral of high-risk patients to tertiary care hospitals.

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